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RETROCAVAL URETER ASSOCIATED WITH POLYCYSTIC DISEASE OF THE KIDNEYS: TREATED BY DIVISION AND REANASTOMOSIS OF THE VENA CAVA

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Cases of retrocaval ureter have been recognized and reported with increased frequency, along with the advance of urological examination. However retrocaval ureter associated with polycystic disease of kidneys is not found in the literatures to date. The forms of treatment of retrocaval ureter are classified into 2 methods, the plastic operation of the urinary tract and the surgical approach for vascular system. The plastic operation of urinary tract were most commonly used in these cases, but only 6 cases were treated by the surgical approach for the cava to date.

Cathro first reported ligation and section of the vena cava in 1952, and in 1954, Corbus described a case which was treated by ligation and section of the cava in 1948. Goodwin et al. presented the first case which was treated by surgical division of the vena cava, mobilization and relocation of the ureter, and reanastomosis of the vena cava in 1957. In Japan Inoue presented the first case which was treated by surgical division and reanastomosis of the cava in 1959. One after another 2 cases were reported which were treated by division and reanastomosis of the cava ; Maekawa in 1962 and Sonoda 1963. These three authors were on the staff of Urological Department of Osaka University (Director : Prof. Kusunoki). This report deals with the fourth case in Japan of retrocaval ureter which was treated by division and reanastomosis of the cava.

CASE REPORT

A 33 years old Japanese man came under our observation on June 23, 1958 with complaint of the right flank pain and hematuria 10 days prior to consultation. In the palpation of the abdomen, large irregular and nodular masses were found in the each renal region suggesting a diagnosis of polycystic renal disease. Cystoscopic examination revealed normal mucous and normal ureteral orifices. In the indigocarmin test the time from injection to the first appearance of the dye from the left orifice was 6 minutes and 48 seconds, but the concentration of the dye was poor. The excretion from the right orifice was not recognized in 10 minutes after injection.

The first admission was on June 24, 1958. Laboratory studies showed the urine loaded with blood cells and a trace of albumin. All other studies were within normal limits. Pneumoretroperitoneum and retrograde pyelography done on June 24, 1958 revealed typical pyelograms of the polycystic renal disease assosiated with right renal calculus (Fig. 1 and Fig. 2). In these pyelograms the slightly ectatic calyces of the right

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kidney and the right ureter which hugs the sinal column were found. By conservative treatments the complaints were improved by three weeks. The patient was discharged on July 17.

After that he had occasional dull pains in the right flank, but he went back to work as a clerk in his office for 2 months. From the middle of September he had recurrent shaking chills followed by fever. On November 16, he had the attack associated with colicky pains.

The second admission was on November 19, 1958. Intravenous pyelograms of November 21 revealed right ureteral calculus at the level of second lumbal vertebra (Fig. 3).

Ureterolithotomy was carried out on November 24. The operation notes are as follows :

The patient was placed in the right flank position, and a conventional kidney incision was made under the twelfth rib. It was extended anteriorly along the abdominal wall, downward to the Mc Burney's point. Dissection was carried through all layers of the abdominal muscles, and entered in to the retroperitoneal space. The peritoneum was pushed forwared and dissection continued down-ward along the psoas muscle until the right ureter and lower pol of the right cystic kidney was identified. Dissection was extended medially, and the ureter which curved behined the vena cava was identified. Then the retrocaval ureter was found. This anomaly was not expected before the operation, and the plan of the operation for the anomaly was not prepared. So that only the ureterolithotomy was carried out. The calculus was found in the upper portion of the ureter which curved behind the cava. A one centimeter length incision was made at that portion and the calculus was extracted with an extractor. The wound in the ureter was closed with interrupted two No. 000 catgut sutures. The muscle layer and skin were closed with interrupted silk sutures. One drain was used. The postoperative course was entirely benign. The patient was discharged on December 25. After that he had occasional dull pain in the right flank, but he went back again to work for 5 years. On April 25, 1964 he again consulted our clinic because of general fatigue, and a scout film of the abdomen disclosed the right renal calculus. He was treated conservatively and his progress was studied.

Three months later he had colicky pain in the right flank and fever. Intravenous pyelogram (Fig. 4) showed right ureteral calculus at the same portion as found at the last operation.

The third admission was on July 28, 1964. He was treated by ureterolithotomy and division of the vena cava, mobilization, and relocation of the ureter, and reanastomosis of the cava on August 4. The operation notes are as follows :

Under general anesthesia the patient was placed in the dorsal position, and lateral rectus incision was made beginning under the costal margin, extending down about 5 centimeters below the level of the umbilicus and the peritoneal cavity was opened. The intestine was divided to the left side and the retroperitoneum was indentified and an incision of about 10 centimeters was made at the paravertebral area to reach the retroperitoneal space. Dissection was extended medially, and the right ureter and the vena cava were identified. A calculus was found at the same portion where calculus was extracted at the last operation. Uretero-

lithotomy was made. And then blunt dissection freed the vena cava and ureter (Fig. 5, 6). After freeing the cava from its fascia, coarctation clamps were placed 2 to 3 centimeters apart where the ureter coursed behind it. When the vena cava was divided with scissors, the ureter was pulled into its normal lateral position. Following this procedure, the cava was reanastomosed with bilateral stitches; a continuous suture of teflontreated dacron suture (No. 5-0) was placed between two primary sutures in such a way that there was a tight closure. When the occluding clamps were removed, there was no bleeding (Fig. 7, 8). The vena cava was occluded approximately 30 minutes and during the occluding time the blood pressure continued at normal levels. The wound was closed in layers with interrupted silk sutures. One drain was used in the retroperitoneal space. The skin was closed with interrupted silk. The postoperative progress was good. Kimopsin was given 2 times in the first 48 hours. He left the hospital on the forty-first postoperative day. Figure 9 shows a postoperative retrograde pyelogram 3 1/2 months after the operation. In this pyelogram the right ureter was in an almost normal position, and the stricture of the ureter was not found.

The intravenous pyelography was made 11 months after the original operation. This pyelogram (Fig. 10) showed the improved hydrocalyces of the right polycystic kidney. He remains well a year after surgery.

DISCUSSION

In 1960 Rowland et al. found over 90 cases of retrocaval ureter in Europe and America. After that Blundon, Voelkel and Lange each reported a case. In Japan, Yamamoto reported the first case in 1941. So far 36 cases including our case have been reported (Table 1). As the complications of these cases, hydronephrosis was found most commonly, and calculi of the urinary tract and renal tuberculosis were found in some cases. However polycystic disease of the kidneys has not reported as complications except in our case. These days preoperative diagnosis of retrocaval ureter can be easily made by an advanced urological examinations. The typical curve (S form) of the right ureter in the pyelogram is found in most cases, but our case was not diagnosed preoperatively for that typical deformity of the right ureter was hidden by the complication of polycystic disease of the kidneys.

After the first conservative operation in this case, we considered what methods of treatment are best for these cases with serious complication if this case should arise again. Conservative treatment would consist in the following: (1) section and reanastomosis of (a) the ureter or (b) the renal pelvis after removing the ureter from its position behind the vena cava; (2) ligation and division or division and reanastomosis of the vena cava.

Goodwin expressed that the section and reanastomosis of the ureter or the renal pelvis (Harrill's operation) may not always be applicable or completely successful, and there are many cases which have required some postoperative treatment (nephrectomy or permanent nephrostomy) for postoperative complications.

The postoperative progress was good in all six cases which were treated by ligation and division of the vena cava in Cathro's and Corbus' cases and division and reanastomosis of the cava in Goodwin's, Inoue's, Maekawa's and Sonoda's cases.

For these reasons we chose the surgical

treatment of division and reanastomosis of the vena cava, and the patient had no complaints and the postoperative result was excellent. The results of division of the urinary tract with reanastomosis in cases of retrocaval ureter have not been uniformly good. In some cases, division of the vena cava may be a good choice of treatment. This procedure is particularly ture when there is absence of the left kidney or disease in the left kidney.

SUMMARY

A case of retrocaval ureter associated with polycystic disease of the kidneys and calculi of the urinary tract is presented and 35 cases of retrocaval ureter were reviewed in Japanese periodicals. This case was reated by surgical division of the vena cava, mobilization, and relocation of the ureter and reanastomosis of the cava. The final result was excellent.

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Table 1. Cases of Retrocaval Ureter in Japan.

Author	Date	Age	Sex	Preoperative Diagnosis	Treatment	Complication
YAMAMOTO	1941	25	male	no	Nephrectomy	Renal tuberculosis
HORIO	1943	22	male	yes	None	Hydronephrosis
HORIO	1943	55	male	yes	Nephrectomy	Renal tuberculosis
SHINODA	1950	36	male	no	Nephrectomy	
TAKEYAMA	1951	26	female	yes	Ureteroplasty	Hydronephrosis & Ureteral calculus
NAMIKI	1952		male	yes	Nephrectomy	Hydronephrosis & Renal calculus
INOUE	1953	50	male	no	Ureteroplasty	Hydronephrosis & Renal calculus
NOZAKI	1953	36	female	no	Nephrectomy	Renal tuberculosis
MOMOSE	1955	18	male	yes	Ureteroplasty	Hydronephrosis
KAWAJI	1956	8	male	no	Nephrectomy	Rupture of kidney
KOKUBO	1957	28	male	yes	Ureteroplasty	Hydronephrosis
NISHIURA	1957	21	male	yes	Ureteroplasty	Hydronephrosis
KANAZAWA	1958	49	male	yes	Ureteroplasty	Hydronephrosis
OGOSHI	1958	45	male	yes	Nephrectomy	Hydronephrosis & Ureteral calculus
INOUE	1959	32	male	yes	Division & reanastomosis of Vena cava	Renal & Ureteral calculi
SHIBA	1960	33	female	no	Nephrectomy	Hydronephrosis
TAKAYASU	1961	19	male	no	Nephrectomy	Hydronephrosis
SHIGA	1961	41	male	yes	Ureteroplasty	Hydronephrosis
ICHIKAWA	1961	26	male	yes	Ureteroplasty	Hydronephrosis
NAKANO	1961	36	male	yes	Ureteroplasty	Hydronephrosis & Renal calculi
OMORI	1961	50	male	yes	Pyelo- & ureteroplasty	Hydronephrosis
KUSUSE	1961	48	male	yes	Pyelolithotomy	Renal calculi
TORIGOE	1962	33	male	yes	Pyelo- & ureteroplasty (Nephrectomy)	Hydronephrosis
HIROSE	1962	29	male	yes	Ureteroplasty	Hydronephrosis
MAEKAWA	1962	24	female	yes	Division & reanastomosis of Vana cava	Hydronephrosis
SONODA	1963	56	male	yes	Division & reanastomosis of Vena cava	Hydronephrosis
SAKATOKU	1963	35	male	yes	Nephrectomy	Hydronephrosis
KONDO	1963	56	male	yes	Ureteroplasty	Hydronephrosis
HIDAI	1963	34	male	yes	Ureteroplasty	Hydronephrosis & Ureteral calculus
OMORI	1963	27	male	yes	None	Hydronephrosis
AOKI	1963	24	male	no	Uretero-vesical reanastomosis	Hydronephrosis
TUCHIYA	1963	31	male	no	Ureteroplasty (Nephrectomy)	Hydronephrosis & Ureteral calculus
YUGE	1964	23	male	yes	Pyeloplasty	Hydronephrosis
NAKAHIRA	1964	60	female	yes	Pyeloplasty	Hydronephrosis
NAMIKI	1965	33	male	yes	Ureteroplasty	Hydronephrosis
FUJII	1965	39	male	no	Division & reanastomosis of Vena cave & Ureterolithotomy	Polycystic disease of kidneys & Ureteral caculus

(Nephrectomy)=The second treatment for postoperative complications

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多発性嚢胞腎を合併した下大静脈後尿管：下大静脈離断再縫合術による治療

社会保険広島市民病院泌尿器科（医長　藤井　浩博士）
藤井　浩　雀部　将　荒木　徹

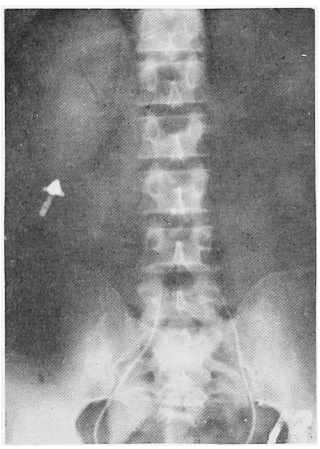

Fig. 1. Simulataneous pneumoretroperitoneum and pneumoretrograde pyelogram. The arrow indicates the renal calculus.

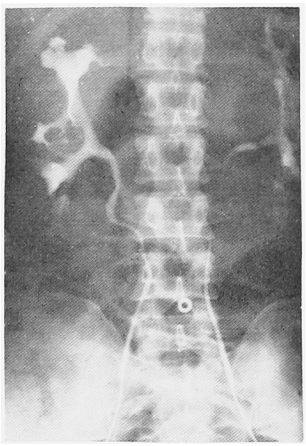

Fig. 2. Simulataneous pneumoretroperitoneum and retrograde pyelogram.

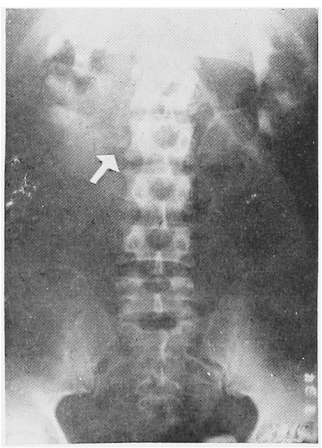

Fig. 3. Intravenous pyelogram on November 21, 1958. The arrow indicates the ureteral calculus.

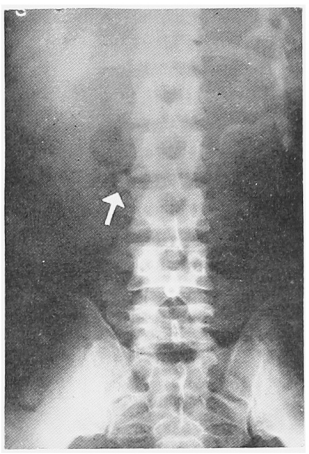

Fig. 4. Intravenous pyelogram on April 25, 1964. The arrow indicates the ureteral calculus in the same portion in Fig. 3.

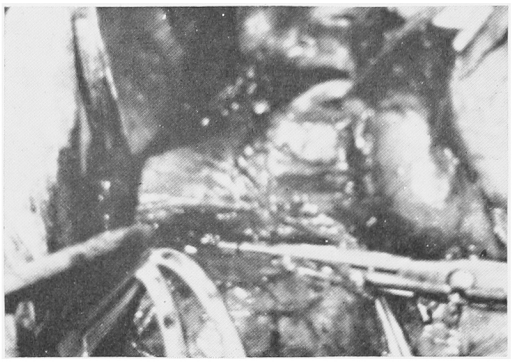

Fig. 5. The surgical procedure : exposure of the field of operation.

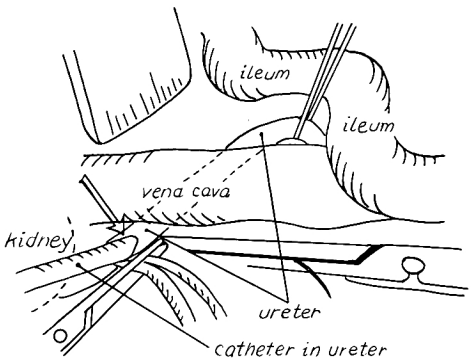

Fig. 6. The drawing illustrating Fig. 5. The arrow indicates the position of ureterolithotomy.

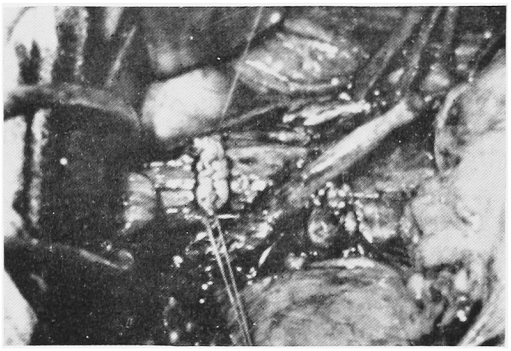

Fig. 7. The surgical procedure anastomosis of the vena cava ; lateralisation of the ureter.

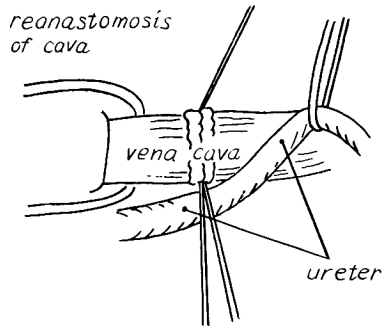

Fig. 8. The drawing illustrating Fig. 7.

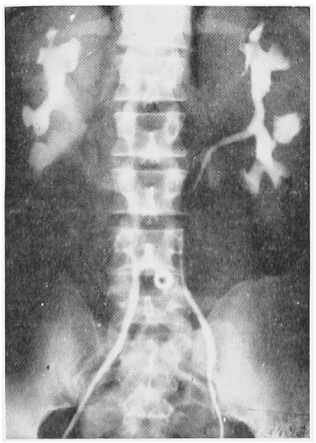

Fig. 9. The postoperative retrograde pyelogram 3 1/2 months after the second operation.

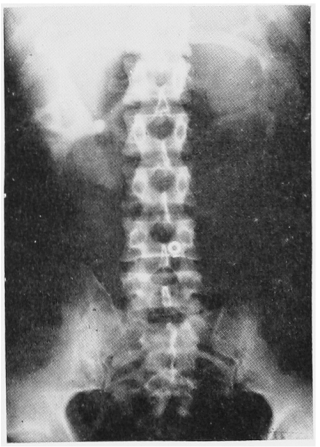

Fig. 10. The intravenous pyelogram 11 months after the second operation.